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Application No. <u>09/619847</u>	Prepared by <u>TE</u>	Tracking Number <u>0595 8401</u>	
Examiner-GAU <u>DOUGHERTY-</u>	Date <u>6-15-04</u>	Week Date <u>5-24-04</u>	
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| a. Serial No. | f. Foreign Priority | k. Print Claim(s) | p. PTO-1449 |
| b. Applicant(s) | g. Disclaimer | l. Print Fig. | q. PTOL-85b |
| c. Continuing Data | h. Microfiche Appendix | m. Searched Column | r. Abstract |
| d. PCT | i. Title | n. PTO-270/328 | s. Sheets/Figs |
| e. Domestic Priority | j. Claims Allowed | o. PTO-892 | t. Other |

SPECIFICATION

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- g. Brief Description
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Form 1449 (Modified)	Atty Docket No. SR11P026/US-4152-2	Application No.: 09/619,847
Information Disclosure Statement By Applicant	Applicant: Pelrine, et al.	
(Use Several Sheets if Necessary)	Filing Date July 20, 2000	Group 2743

U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub- class	Filing Date
	A1						
	A2						

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub- class	Translation	
							Yes	No
	B1							
	B2							

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NOV 0 6 2002

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	C1	Beckett, Jamie, "New Robotics Tap the Mind, Help the Heart, S&P shows of latest technologies", San Francisco Chronicle, August 27, 1998.
	C2	Kornbluh, Roy "Use of Artificial Muscle Butterfly for Chronicle Newspaper Photograph", August 1998.
	C3	
	C4	
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Pei et al.

Application No.: 09/619,847

Filed: July 20, 2000

Title: ELECTROACTIVE POLYMERS



PATENT
#5 / IDS
Atty Docket No.: SRI1P026/US-4152-2

Examiner: Not Assigned

Group: 2743

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INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR §§1.56 AND 1.97(c)

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Commissioner for Patents
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Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is believed to be filed before the mailing date of a first Office Action on the merits. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. SRI1P026).

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP

[Signature]

William J. Plut

Limited Recognition under 37 C.F.R. §10.9(b)

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Form 1449 (M dified)	FEB 27 2001	Atty Docket No. SRI1P026/US-4152-2	Application No.: 09/619,847
Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)		Applicant: Pei et al. Filing Date July 20, 2000	

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Examiner Initial	No.	Patent No.	Date	Patentee	Class	Subclass	Filing Date
	A1	5,902,836	05/11/99	Bennet et al.			08/23/95
	A2	5,229,979	07/20/93	Scheinbeim et al.			12/13/91
	A3	5,642,015	06/24/97	Whitehead et al.			05/01/95
	A4	5,835,453	11/10/98	Wynne et al.			05/05/97

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	A5	Aramaki, S., S. Kaneko, K. Arai, Y. Takahashi, H. Adachi, and K. Yanagisawa. 1995. "Tube Type Micro Manipulator Using Shape Memory Alloy (SMA)," <i>Proceedings of the IEEE Sixth International Symposium on Micro Machine and Human Science</i> , Nagoya, Japan, pp. 115-120.
	A6	Bharti, V., Y. Ye, T.-B. Xu and Q. M. Zhang, "Correlation Between Large Electrostrictive Strain and Relaxor Behavior with Structural Changes Induced in P(VDF-TrFE) Copolymer by electron Irradiation," <i>Mat. Res. Soc. Symp. Proc. Vol 541</i> , pp. 653-659 (1999).
	A7	Bobbio, S., M Kellam, B. Dudley, S. Goodwin Johansson, S. Jones, J. Jacobson, F. Tranjan, and T. DuBois, "Integrated Force Arrays," in <i>Proc. IEEE Micro ElectroMechanical Systems Workshop</i> , Fort Lauderdale, Florida February 1993.
	A8	Caldwell, D., G. Medrano-Cerda, and M. Goodwin, "Characteristics and Adaptive Control of Pneumatic Muscle Actuators for a Robotic Elbow," <i>Proc. IEEE Int. Conference on Robotics and Automation</i> , San Diego, California (8-13 May 1994).
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	A10	Cheng, Z.-Y., H. S. Xu, J. Su, Q. M. Zhjang, P.-C. Wang, and A. G. MacDiarmid, "High performance of all-polymer electrostrictive systems," <i>Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices</i> , March 1-2, 1999, Newport Beach, California, USA., pp. 140-148.
	A11	De Rossi, D., and P. Chiarelli. 1994. "Biomimetic Macromolecular Actuators," <i>Macro-Ion Characterization, American Chemical Society Symposium Series</i> , Vol. 548, Ch. 40, pp. 517-530.
	A12	Egawa, S. and T. Higuchi, "Multi-Layered Electrostatic Film Actuator," <i>Proc. IEEE Micro Electra Mechanical Systems</i> , Napa Valley, California, pp. 166-171 (February 11-14, 1990).
	A13	Full, R. J. and K. Meijer, "Artificial Muscles Versus Natural Actuators From Frogs To Flies," <i>Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference</i> , March 6-8, 2000, Newport Beach, California, USA, pp. 2-9.
Examiner		Date Considered

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Form 1449 (Modified)	Patent Docket No. SRIIP026/US-4152-2	Application No. 09/619,841
Information Disclosure Statement By Applicant	Applicant: Pei et al.	Group 2743
(Use Several Sheets if Necessary)	Filing Date July 20, 2000	

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	B1	Furuhata, T., T. Hirano, and H. Fujita, "Array-Driven Ultrasonic Microactuators," Solid State Sensors and Actuators, 1991, Digest of Tech. Papers, Transducers, pp. 1056-1059
	B2	Gilbertson, R.G., and J.D. Busch. 1994. "Survey of Micro-Actuator Technologies for Future Spacecraft Missions," presented at the conference entitled "Practical Robotic Interstellar Flight: Are We Ready?" New York University and The United Nations, New York. (August 29 and September 1, 1994); also published on the World Wide Web at http://nonothinc.com/nanosci/microtech/mems/ten-actuators/gilbertson.html .
	B3	Hirano, M., K. Yanagisawa, H. Kuwano, and S. Nakano, "Microvalve with Ultra-low Leakage," Tenth Annual International Workshop on Micro Electromechanical Systems, Nagoya, Japan, <i>IEEE Proceedings</i> (January 26-30, 1997), pp. 323-326.
	B4	Hirose, S., Biologically Inspired Robots: Snake-like Locomotors and Manipulators, "Development of the ACM as a Manipulator", Oxford University Press, New York, 1993, pp.170-172.
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	B10	Liu, Y., T. Zeng, Y.X. Wang, H. Yu, and R. Claus, "Self-Assembled Flexible Electrodes on Electroactive Polymer Actuators," <i>Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices</i> , March 1-2, 1999, Newport Beach, California, USA., pp. 284-288.
	B11	Olsson, A., O. Larsson, J. Holm, L. Lundbladh, O. Ohinan, and G. Stemme. 1997. "Valve-less Diffuser Micropumps Fabricated using Thermoplastic Replication," <i>Proc. IEEE Micro Electro Mechanical Systems</i> , Nagoya, Japan, pp. 305-310 (January 26-30, 1997).
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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty Docket No. SRI1P026/US-4152-2	Application No.: 09/619,847
	Applicant: Pei et al. Filing Date July 20, 2000	Group 2743

Other Documents

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	C1	Olsson, A., G. Stemme, and E. Stemme, "The First Valve-less Diffuser Gas Pump," Tenth Annual International Workshop on Micro Electromechanical Systems, Nagoya, Japan, <i>IEEE Proceedings</i> (January 26-30, 1997), pp.108-113.
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	C3	Su, J., Z. Ounaies, J. S. Harrison, Y. Bara-Cohen and S. Leary, "Electromechanically Active Polymer Blends for Actuation," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 65-72.
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	C5	Winters, J., "Muscle as an Actuator for Intelligent Robots," <i>Robotics Research: Trans. Robotics International of SME</i> , Scottsdale, AZ (August 18-21, 1986).
	C6	Zhang, Q. M., V. Bharti, Z.-Y. Cheng, T.-B. Xu, S. Wang, T. S. Ramotowski, F. Tito, and R. Ting, "Electromechanical Behavior of Electroactive P(VDF-TrFE) Copolymers," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 134-139.
	C7	Zhang, Q. M., Z.-Y. Cheng, V. Bharti, T.-B. Xu, H. Xu, T. Mai, and S. J. Gross, "Piezoelectric And Electrostrictive Polymeric Actuator Materials," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 34-50.
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Form 1449 (Modified)

Information Disclosure
Statement By Applicant

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FEB 27 2001

Atty Docket No.
SRIIP026/US-4152-2

Application No.:

09/619,842

Applicant:

Pei et al.

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July 20, 2000

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	D1	Kornbluh, R., R. Pelrine, J. Joseph, "Elastomeric Dielectric Artificial Muscle Actuators for Small Robots," <i>Proceedings of the Third IASTED International Conference on Robotics and Manufacturing</i> , June 14-16, 1995, Cancun, Mexico.
	D2	Kornbluh, R., R. Pelrine, Jose Joseph, Richard Heydt, Qibing Pei, Seiki Chiba, 1999. "High-Field Electrostriction Of Elastomeric Polymer Dielectrics For Actuation", <i>Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices</i> , March 1-2, 1999, Newport Beach, California, USA. pp. 149-161.
	D3	Kornbluh, R., R. Pelrine, Q. Pei, S. Oh, and J. Joseph, 2000. "Ultrahigh Strain Response of Field-Actuated Elastomeric Polymers," <i>Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference</i> , March 6-8, 2000, Newport Beach, California, USA, pp. 51-64.
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	D5	Pelrine, R., R. Kornbluh, J. Joseph, and S. Chiba, "Electrostriction of Polymer Films for Microactuators," <i>Proc. IEEE Tenth Annual International Workshop on Micro Electro Mechanical Systems</i> , Nagoya, Japan, January 26-30, 1997, pp. 238-243.
	D6	Pelrine, R., J. Eckerle, and S. Chiba, "Review of Artificial Muscle Approaches," invited paper, in <i>Proc. Third International Symposium on Micro Machine and Human Science</i> , Nagoya, Japan, October 14-16, 1992
	D7	Pelrine, R., Roy Kornbluh, Jose Joseph, Qibing Pei, Seiki Chiba "Recent Progress in Artificial Muscle Micro Actuators," , SRI International, Tokyo, 1999 MITI/NEEDOIMNIC, 1999
Examiner	Date Considered	

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FEB 27 2001
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Form 1449 (Modified)	Atty Docket No. SRI1P026/US-4152-2	Application No.: 09/619,847
Information Disclosure Statement By Applicant	Applicant: Pei <i>et al.</i>	
(Use Several Sheets if Necessary)	Filing Date July 20, 2000	Group 2743

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	E1	Pelrine, R., R. Kornbluh, and J. Eckerle, "Elastomeric Dielectric Polymer Film Sonic Actuator," US Provisional Patent Application No. 60/037,400, filed Feb. 7, 1997.
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	E8	Bharti, V., H. S. Xu, G. Shanthi, and Q. M. Zhang, "Polarization and Structural Properties of High Energy Electron Irradiated Poly(vinylidene fluoride-trifluoroethylene) Copolymer Films," to be published in <i>J. Appl. Phys.</i> (2000).
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(Use Several Sheets if Necessary)			

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	F1	Bohon, K., and S. Krause, "An Electrorheological Fluid and Siloxane Gel Based Electromechanical Actuator: Working Toward an Artificial Muscle," to be published in <i>J. Polymer Sci., Part B. Polymer Phys.</i> (2000)
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	F3	Chiarelli, P., A. Della Santa, D. DeRossi, and A. Mazzoldi. 1995. "Actuation Properties of Electrochemically Driven Polypyrrole Free-standing Films," <i>Journal of Intelligent Material Systems and Structures</i> , Vol. 6, pp. 32-37, January 1995
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	F5	Flynn, Anita M., L.S. Tavrow, S.F. Bart, R.A. Brooks, D.J. Ehrlich, K.R. Udayakumar, and L.E. Cross. 1992. "Piezoelectric Micromotors for Microrobots," <i>IEEE Journal of Microelectromechanical Systems</i> , Vol.1, No.1, pp. 44-51 (March 1992); also published as <i>MIT AI Laboratory Memo 1269</i> , Massachusetts Institute of Technology (February 1991).
	F6	Furukawa, T., and N. Seo., "Electrostriction as the Origin of Piezoelectricity in Ferroelectric Polymers," <i>Japanese J. Applied Physics</i> , Vol. 29, No. 4, pp. 675-680 (April 1990).
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	F8	Kondoh Y., and T. Ono. 1991. "Bimorph Type Actuators using Lead Zinc Niobate-based Ceramics," <i>Japanese Journal of Applied Physics</i> , Vol. 30, No. 9B, pp. 2260-2263, September 1991.
	F9	Lawless, W. and R. Arenz, "Miniature Solid-state Gas Compressor," <i>Rev. Sci Instrum.</i> , 58(8), pp.1487-1493, August 1987
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	F11	Ohara, K., M. Hennecke, and J. Fuhrmann, "Electrostriction of polymethylmethacrylates," <i>Colloid & Polymer Sci.</i> Vol 280, 164-168 (1982).
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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	FEB 27 2001 Atty Docket No. SRI1P026/US-4152-2 Applicant: Pei et al. Filing Date July 20, 2000	Application No.: 09/619,847 RECEIVED MAR 01 2001 Technology Center 2600 Grossing 2743
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	G2	Park, S.E., and T. Shrout, "Ultrahigh Strain and Piezoelectric Behavior in Relaxor Based Ferroelectric Single Crystals," <i>J Applied Physics</i> , Vol. 82, pp. 1804-1811, August 15, 1997
	G3	Pei, Q., O. Inganäs, and I. Lundström, "Bending Bilayer Strips Built From Polyaniline For Artificial Electrochemical Muscles," <i>Smart Materials and Structures</i> , Vol.2, pp. 16., January 22, 1993
	G4	Scheinbeim, J., B. Newman, Z. Ma, and J. Lee, "Electrostrictive Response of Elastomeric Polymers," <i>ACS Polymer Preprints</i> , 33(2), pp.385-386, 1992
	G5	Schlager, H. I., and J. S. Duffy, "Piezoelectric Polymer Composite Arrays For Ultrasonic Medical Imaging Applications," <i>Sensors and Actuators</i> , A 44, pp. 111-117, February 22, 1994
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	G7	Shkel, Y., and D. Klingenberg, "Material Parameters for Electrostriction," <i>J Applied Physics</i> , Vol. 80(8), pp. 4566-4572, October 15, 1996
	G8	Smela, E., O. Inganäs, and I. Lundström, "Controlled Folding of Micrometer-size Structures," <i>Science</i> , Vol. 268, pp. 1735-1738 (23 June 1995).
	G9	Smela, E., O. Inganäs, Q. Pei, and I. Lundström, "Electrochemical Muscles: Micromachining Fingers and Corkscrews," <i>Advanced Materials</i> , Vol.5, No. 9, pp.630-632, September 1993
	G10	Su, J., Q. M. Zhang, C. H. Kim, R. Y. Ting, and R. Capps, "Effects of Transitional Phenomena on the Electric Field induced Strain-electrostrictive Response of a Segmented Polyurethane Elastomer," pp. 1363-1370, January 20, 1997.
	G11	Tobushi, H., S. Hayashi, and S. Kojima, "Mechanical Properties of Shape Memory Polymer of Polyurethane Series," in <i>JSME International Journal</i> , Series I, Vol.35, No.3, 1992
	G12	Uchino, K. 1986. "Electrostrictive Actuators: Materials and Applications," <i>Ceramic Bulletin</i> , 65(4), pp. 647-652, 1986
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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty Docket No. SRIIP026/US-4152-2	Application No.: 09/619 847
	Applicant: Pei <i>et al.</i> Filing Date July 20, 2000	Group 2743

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Form 1449 (Modified)

Information Disclosure Statement By Applicant

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Atty Docket No. SR11P026/US-4152-2

Applicant: Pei et al.

Filing Date July 20, 2000

Application No. 09/619,847

Group 2743

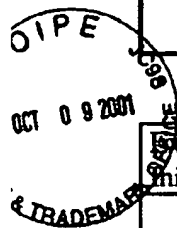
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	J8	Pelrine et al., "Electroactive Polymer Transducers and Actuators", U.S. Patent Application No. 09/620,025, filed July 20, 2000, 58 pages
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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty Docket No.	Application No.:
	SRIIP026/US-4152-2	09/619,847
	Applicant:	
	Pei, et al.	
	Filing Date	Group
	July 20, 2000	2743



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Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)	Atty Docket No. SRIIP026/US-4152-3	Application No.: 09/619,847
	Applicant: Pelrine <i>et al.</i>	Filing Date July 20, 2000



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U.S. Patent Documents

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	A						
	B						
	C						
	D						
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Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation	
							Yes	No
	J							
	K							
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